

Feasibility study Nagold – Herrenberg Presentation of results

**Environment and Transport Committee of the Böblingen District 1 December
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Study design

*"Against the backdrop of a significant increase in federal and state funding for expansion measures in regional rail and local public transport, the **medium and long-term prospects** for the further development of local public transport services in the Nagold – Herrenberg area are to be investigated." (Service description)*

Stage 1: Potential analysis

- Determination of transport impacts based on simplified infrastructure and operational planning
- Conducting a potential analysis for a total of **eleven study variants**
 - Four light rail variants
 - S-Bahn variant
 - Variant with Transport System Bögl
 - Four metropolitan express sub-variants
 - Improvements to bus services

Stage 2: Cost-benefit analysis

- Selection of promising planning scenarios from the potential analysis
- Conducting a cost-benefit analysis based on the 2016+ standardised evaluation procedure

Light rail variants

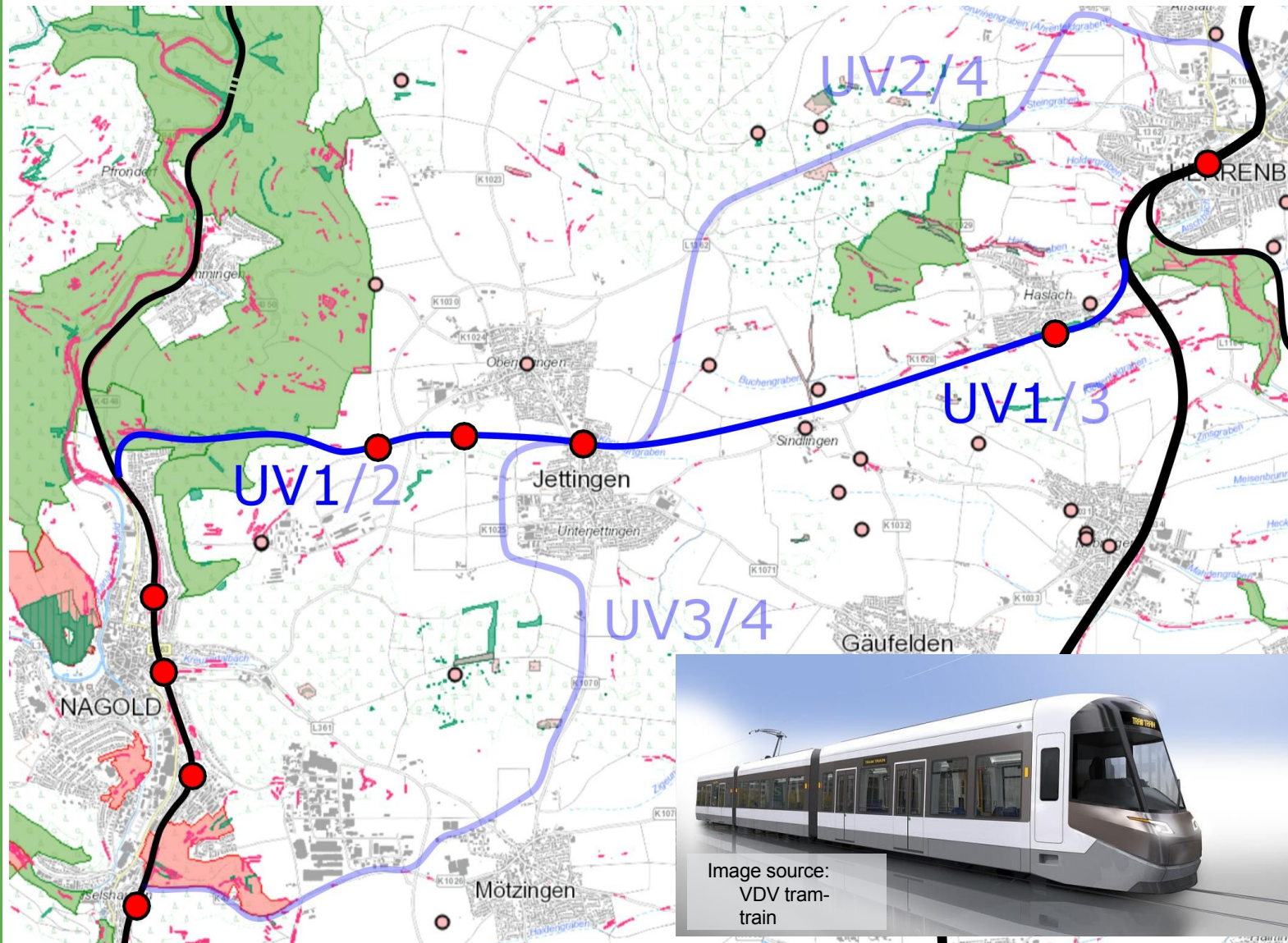


Image source:
VDV tram-
train

Four branch lines were developed and corresponding combinations considered, resulting in four sub-variants.

Due to the promising effects of a less demanding route, study variant 1 was recommended for stage 2.

The service will run every 30 minutes.

The NKV is **0.66**. A variant with a connection to the west of Nagold achieves **0.35**.

Sensitivity: Light rail UV1 with connection

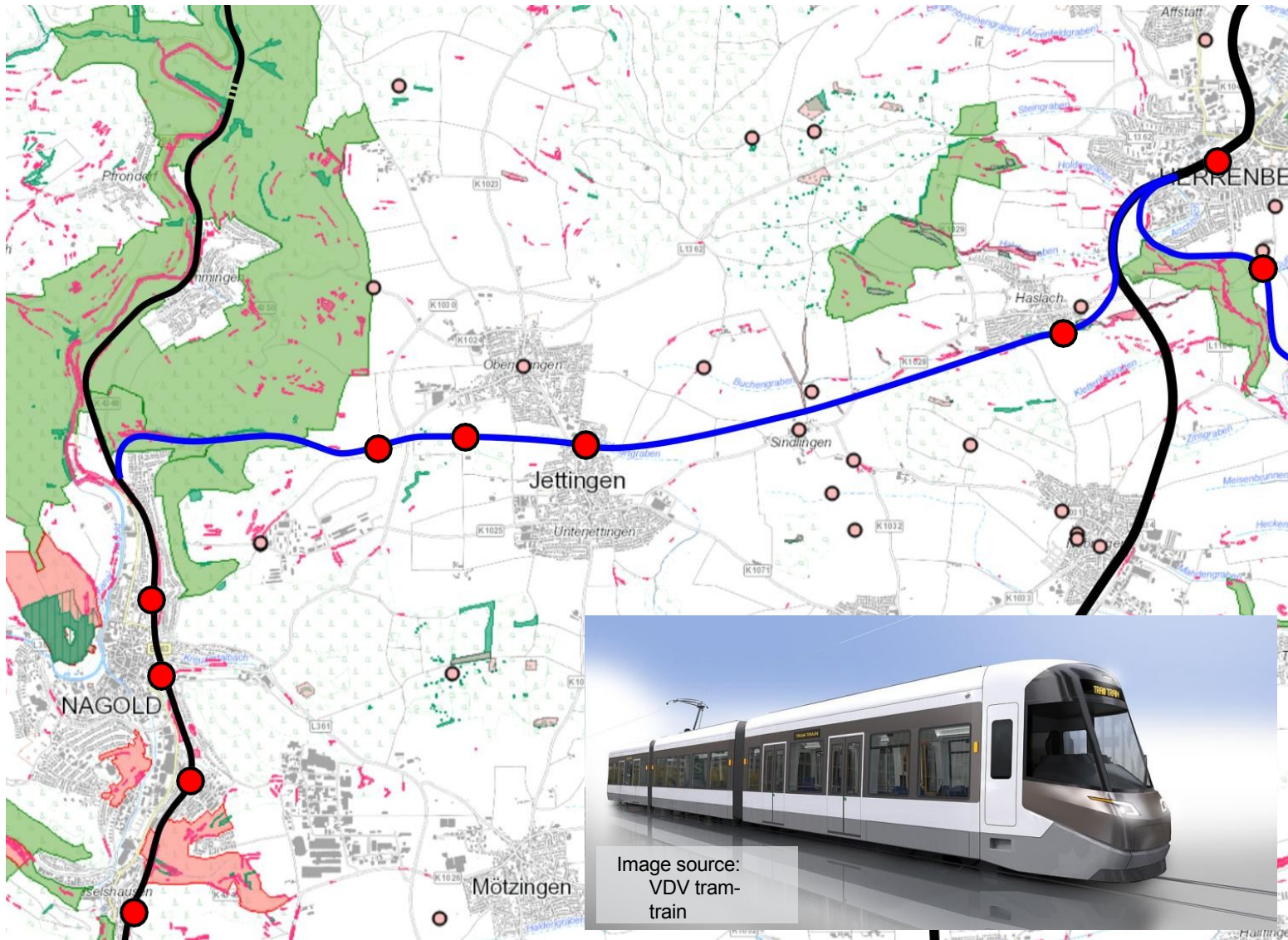


Image source:
VDV tram-
train

The use of **tram-trains on the Ammertalbahn railway** is a prerequisite for a through service. Currently, standard gauge vehicles are used there.

It was therefore **sensitively** assumed that Herrenberg would be served by tram-trains.

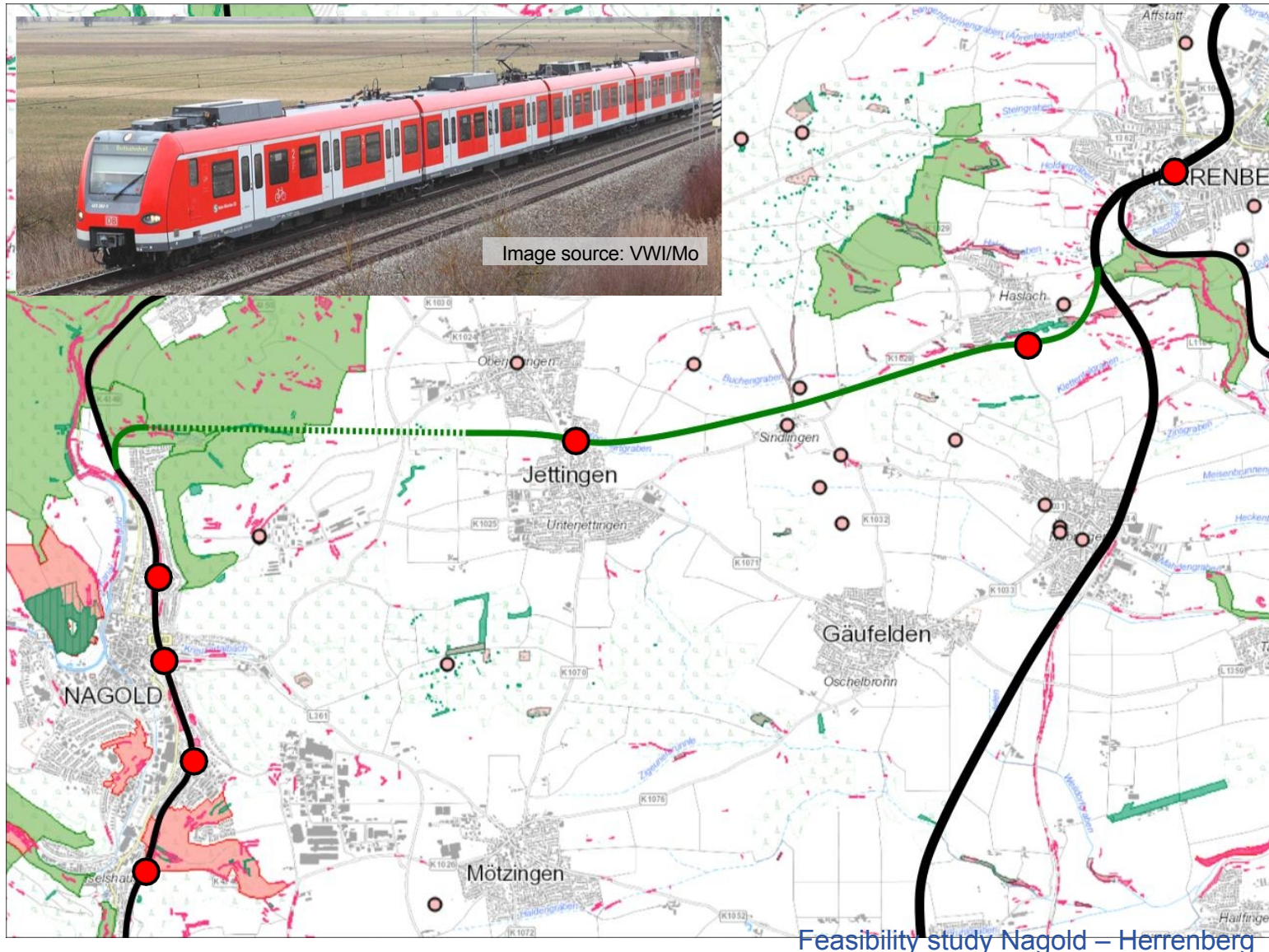
There is now a direct connection every 30 minutes from Nagold to Tübingen via the Ammertalbahn.

The NKV is **1.14**.

Extension of the S-Bahn



Image source: VWI/Mo



Feasibility study Nagold – Herrenberg

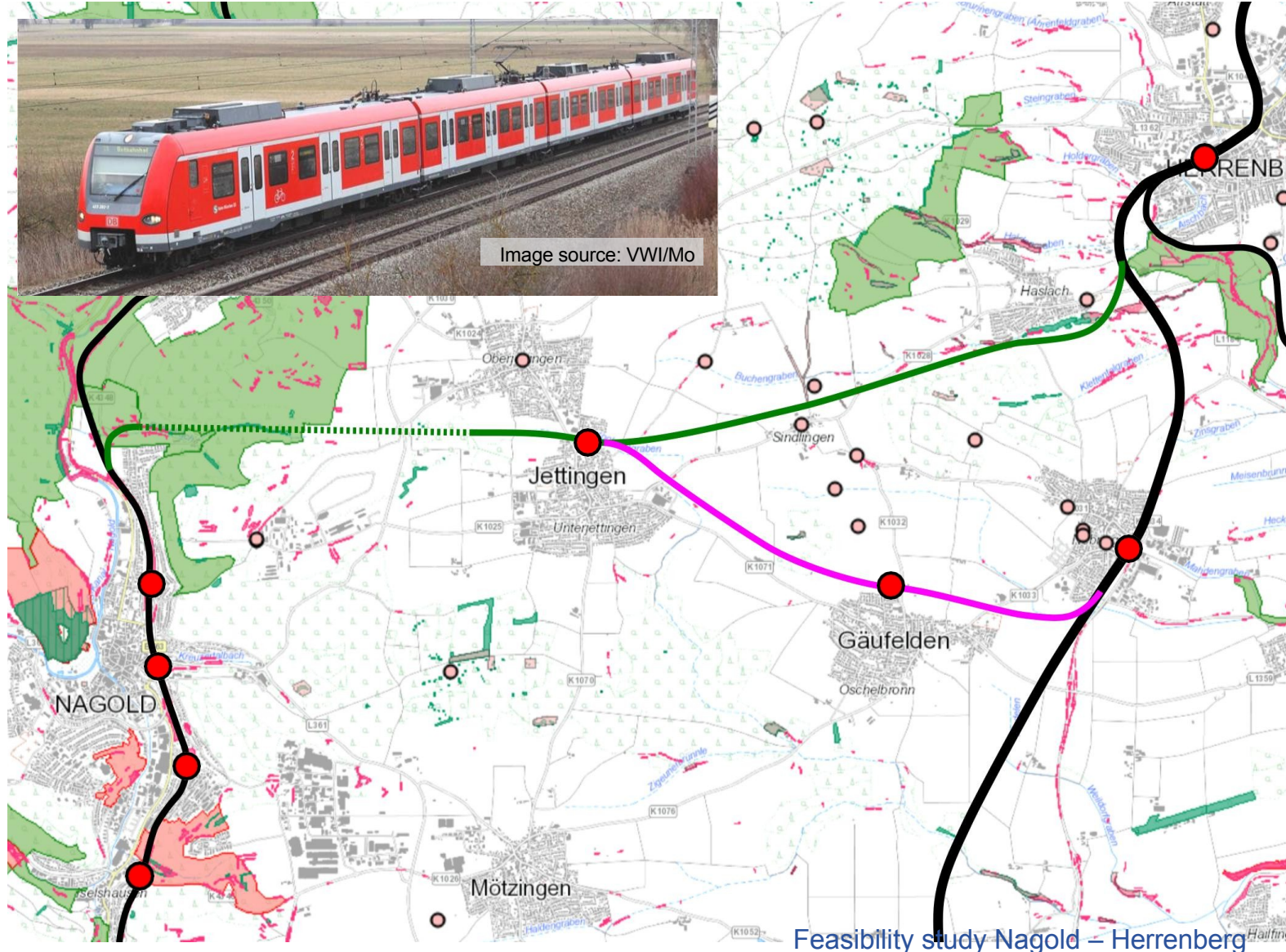
The S-Bahn variant is based on previous studies and includes an S1 extension with trains running every 30 minutes.

The long tunnel section between Jettingen and Nagold poses a particular challenge.

Service will be provided by strengthening/weakening the S-Bahn intermediate intervals in Herrenberg.

The NKV is **0.61**.

Öschelbronn S-Bahn variant



Alternative route via Gäufelden significantly minimises infrastructure costs.

The main reason for this is the significantly less challenging topography, especially in the Haslach area.

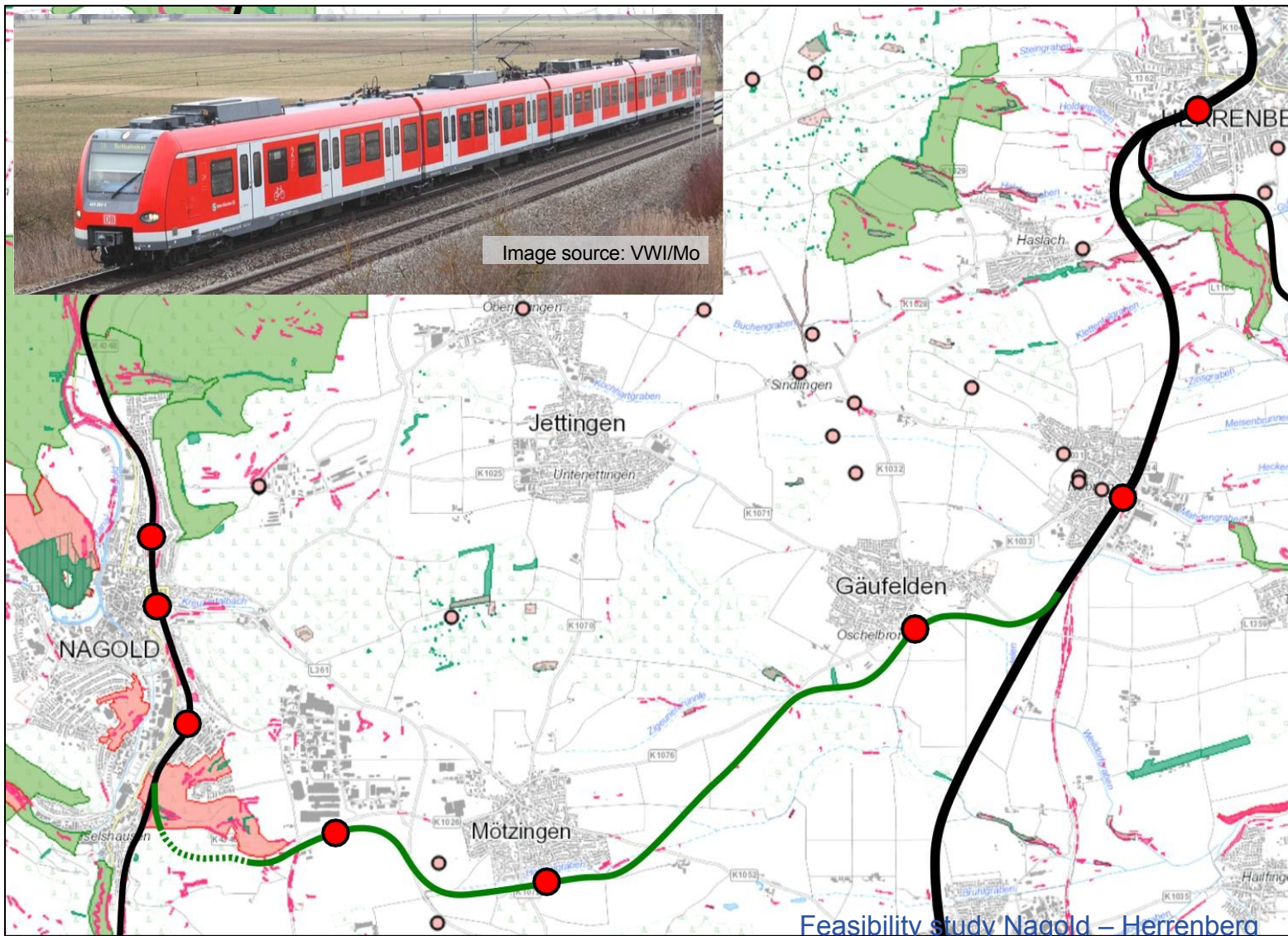
Travel time is extended by approx. 3 minutes, but Gäufelden is better connected.

The NKV is **0.75**.

Extension of the S-Bahn via Mötzingen



Image source: VWI/Mo



The tunnel section could be significantly reduced. However, this means that the connection to Jettingen will no longer be included.

Service will be provided by strengthening/weakening the S-Bahn intermediate intervals in Herrenberg.

The investment costs are estimated at €319 million (2023 prices), which saves 189 million euros compared to a variant via Jettingen.

However, the route via Mötzingen also reduces the traffic impact.

The NKV is **0.70**.

Relocation of MEX Freudenstadt

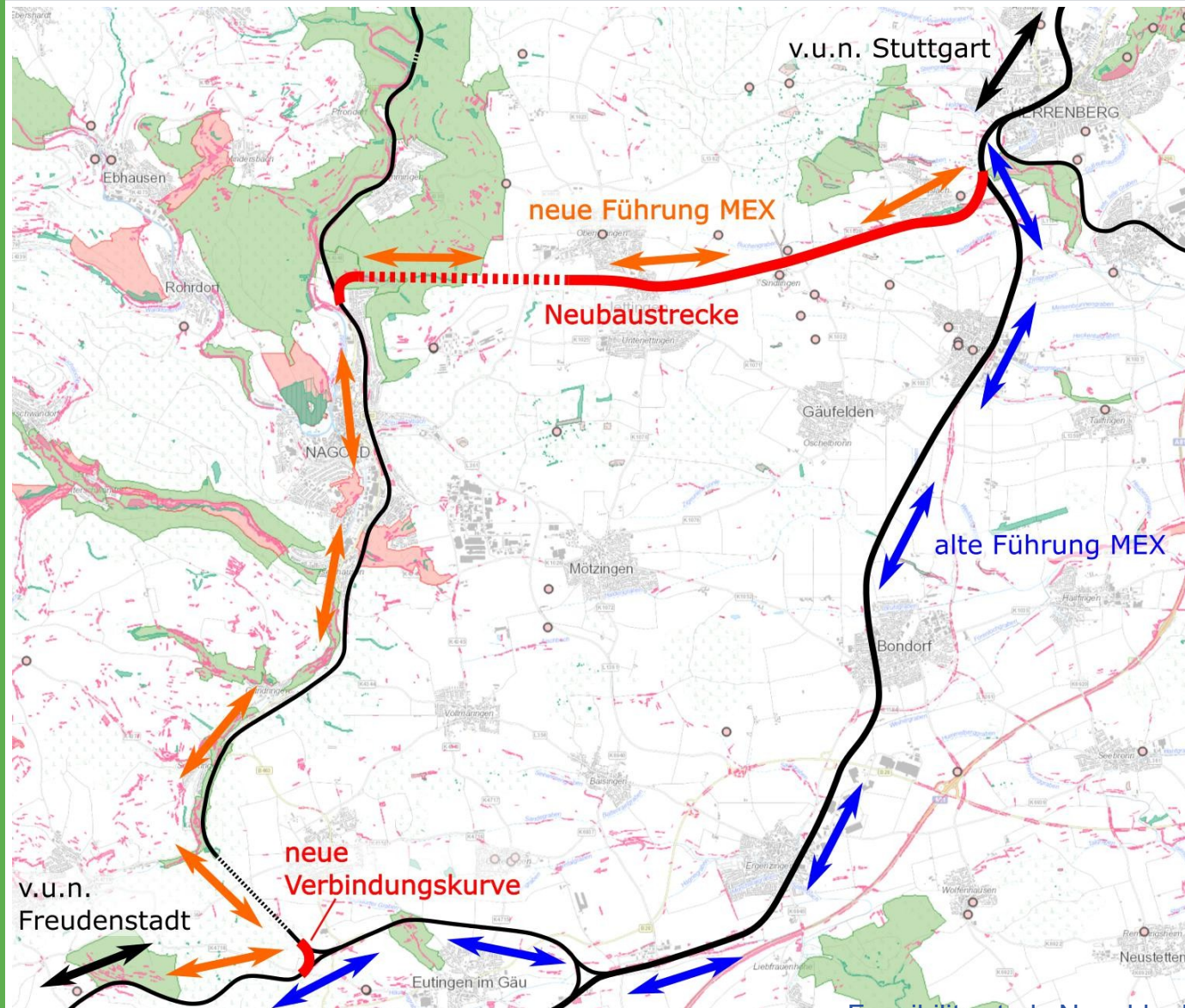


Image source:
VWI/Mo

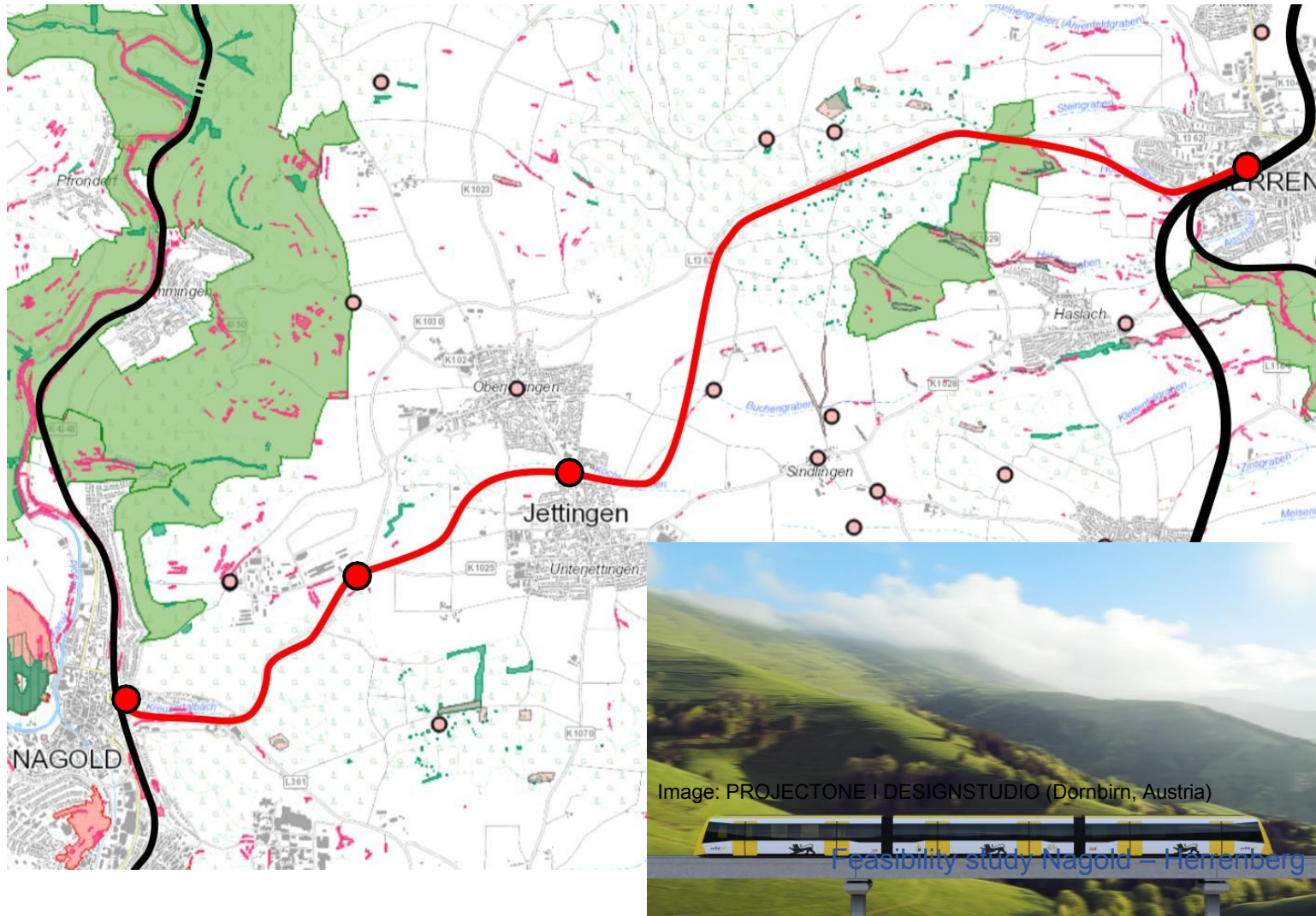
Instead of travelling via Eutingen im Gäu, the MEX Freudenstadt will now run via Jettingen and Nagold.

Additional infrastructure is required:

- New Nagold – Herrenberg line with tunnel
- Hochdorf connecting curve
- Additional crossing possibilities

The NKV is **0.70**.

Bögl transport system (TSB) Direct connection with short route



This variant runs as a separate route from Herrenberg to Nagold city centre and results in very short journey times.

Different cycle patterns were tested, as the TSB can operate autonomously. The variant with a 15-minute cycle is examined in more detail below.

The NKV is **0.93**.

Comparison of assessment results									
Measure	Light rail UV 1	Light rail UV 1 Through connection (sensitive)	Nagold Mitte light rail	Suburban railway via Haslach	Suburban railway via Öschelbronn	Suburban railway via Mötzingen	MEX Freudenstadt	TSB short	TSB long
Sub-indicators [T€/year]									
Transport impacts	3,180	4,480	2,260	5,430	6,140	4,930	2,990	2,260	4,120
Balance of public transport operating costs	-2,340	-2,340	-1,890	-2,750	-2,870	-3,520	-210	-140	-660
Infrastructure maintenance costs	-530	-590	-590	-660	-630	-690	-670	-390	-610
Balance of CO ₂ emissions	440	660	240	60	130	720	-310	190	470
Other external factors	270	540	200	700	720	570	340	330	650
Utility analysis	1,290	1,450	1,070	2,120	2,090	1,420	1,190	620	1,470
Total individual benefits	2,320	4,200	1,290	4,890	5,560	3,430	3,340	2,870	5,440
Infrastructure debt service	3,530	3,670	3,670	8,020	7,400	4,930	7,010	3,080	4,560
Cost-benefit ratio	0.66	1.14	0.35	0.61	0.75	0.70	0.48	0.93	1.19
Investment costs [million euros] (2023 prices incl. 20% planning costs)	222.9	233.9	225.8	555.4	507.7	319.3	480.4	201.3	293.9
Travel time Herrenberg – Nagold town centre [min]	16	16	15	14	17	18	14	11	14

Conclusion and next steps

- The study shows that the Herrenberg – Nagold corridor has a demand that can be classified as "railworthy".
 - Variants with a **direct connection** to Stuttgart (S-Bahn, MEX) have the greatest transport impacts. However, the challenging topography results in very high construction and operating costs, as a tunnel is required for S-Bahn or MEX trains.
 - In the sensitive variant **of a light rail connection** from Tübingen, a cost-benefit ratio of > 1.0 was determined, which is eligible for funding.
 - The **Bögl transport system** (magnetic levitation train) also achieved a cost-benefit ratio of > 1.0 in a variant with good access to the city of Nagold.
- The pursuit of a purely **rail-based connection** on the Herrenberg – Jettingen – Nagold cannot therefore be recommended under the current conditions.
- The corridor also shows high potential that is not yet fully exploited by today's **bus connections**. In the short and medium term, it is recommended to also strive to improve bus connections.

Conclusion and further action

Sensitive variant: light rail UV 1 through connection

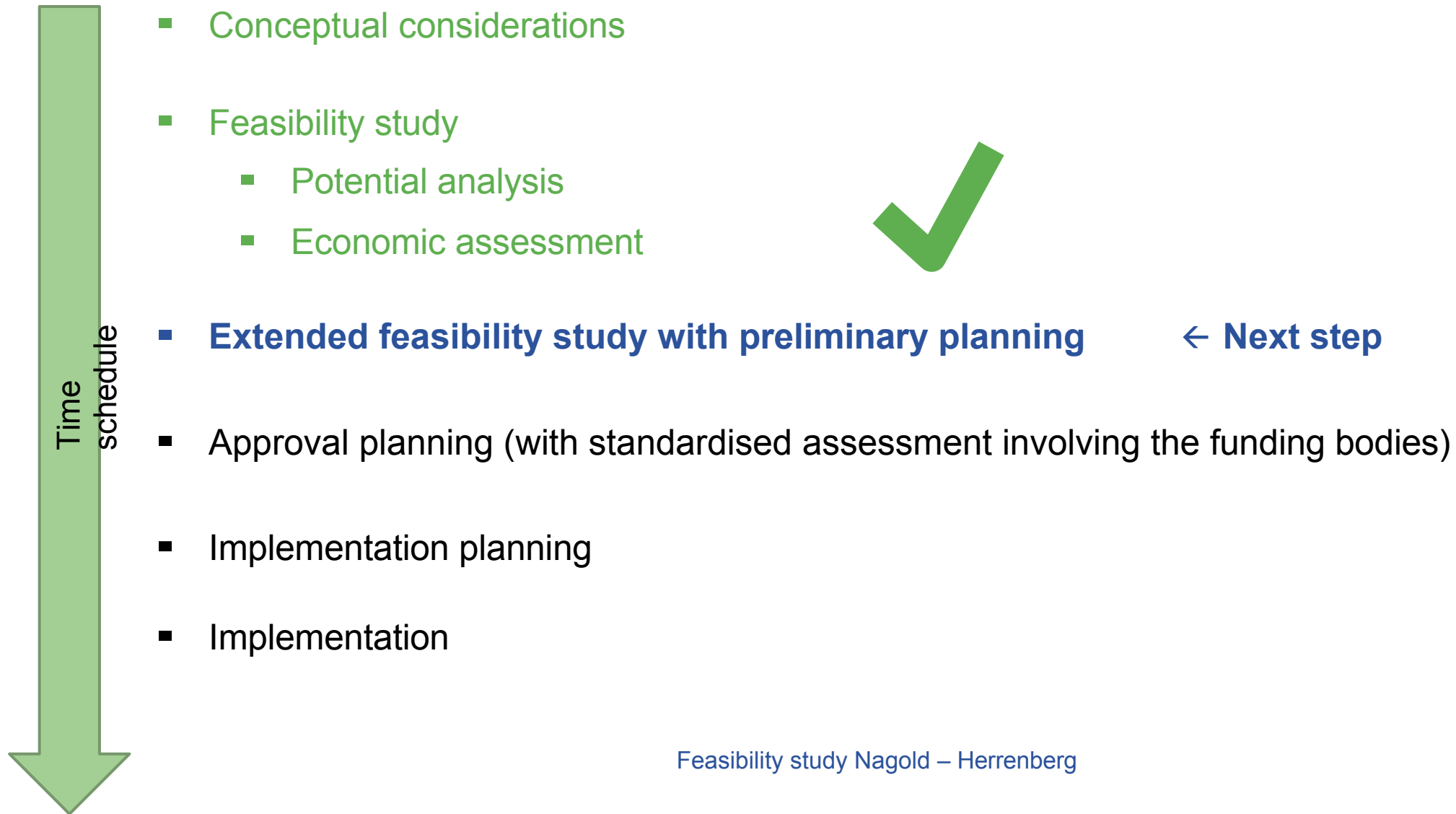
- This variant has a **promising cost-benefit ratio**, but was based on a fictitious no-case scenario. sensitivity based on a fictitious no-action scenario. Without this connection, the transport effects are insufficient.
- First, the long-term possibilities would have to be secured. For a through service, it is necessary to **use multi-system tram-trains on the Ammertalbahn**. This would need to be worked on together with the parties involved.
- The S-Bahn variants have shown that a **route via Gäufelden** can have a greater impact on traffic than a variant via Haslach. This finding should also be taken into account in further planning steps for tram-train variants.
- The **timetable and operating concept for the Gäubahn** is still under discussion. The infrastructure in Herrenberg depends on the appropriate intervals on the Gäubahn. The possible use of the tracks by tram-trains depends on the operating concept.

Conclusion and next steps

Bögl transport system (TSB) Long route Detailed development

- This option has a **promising cost-benefit ratio**. However, as the TSB not yet included in the GVFG, calculations have been based on assumptions to date. The inclusion of the TSB into the GVFG is stipulated in the coalition agreement and is expected in the near future.
- Due to the **isolated infrastructure**, there are no connection options. A workshop location must also inevitably be found along the route. However, this reduces the operational influence of other traffic.
- The infrastructure is **self-sufficient**. This means that there are no dependencies on other players outside the control of those involved.
- **Autonomous operation makes it** economically feasible to run **services every 15 minutes**, which achieves the greatest impact among the options considered without through services.
- This is a **newly developed system** that is currently in operation on test tracks. It is therefore not yet possible to draw on everyday experience.

Next steps: Planning process for public transport projects



Feasibility study Nagold – Herrenberg

Thank you for your attention!

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